

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

CITY OF PROVIDENCE, RHODE ISLAND,
Individually and on Behalf of All Others
Similarly Situated,

Civil Action No. 1:14-cv-02811-JMF
(Consolidated)

Plaintiffs,

vs.

BATS GLOBAL MARKETS, INC., et al.,

Defendants.

**MEMORANDUM OF LAW IN SUPPORT OF DEFENDANTS' MOTION
TO EXCLUDE THE OPINIONS AND TESTIMONY OF JOHN D. FINNERTY**

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Defendants submit this memorandum in support of their motion to exclude the opinions and testimony of Professor John D. Finnerty.¹

PRELIMINARY STATEMENT

Finnerty opines that damages allegedly suffered by putative class members who traded shares of stock during the Class Period on Defendants' stock exchanges can be calculated on a classwide basis. Finnerty does not opine on any other element of Plaintiffs' Section 10(b) claim.²

Finnerty's opinion that damages can be calculated on a classwide basis is not admissible because *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993), and Federal Rule of Evidence 702 require that a proposed expert opinion be both reliable and relevant by aiding the Court in determining the issues to be decided. Finnerty's opinions meet neither requirement.

First, Finnerty's opinions are based on the inadmissible opinions of Plaintiffs' other expert, David Lauer; Finnerty's opinions should be excluded for that reason alone. Second, Finnerty's opinions are irrelevant because his damages model fails to "fit" Plaintiffs' theory of liability, as required by *Comcast Corp. v. Behrend*, 569 U.S. 27, 35 (2013), and lacks sufficient detail to aid the Court in determining whether damages could be computed on a classwide basis. Third, Finnerty's opinions are unreliable because his model (1) is fundamentally flawed from a statistics perspective, (2) relies on assumptions contradicted by the evidence, and (3) uses an approach

¹ Plaintiffs filed Finnerty's original report on May 28, 2021 (ECF No. 619-2). Plaintiffs served a revised version on June 17, 2021, which Plaintiffs did not file. The revised version is attached hereto as Exhibit A-1 (the "Finnerty Report"). Finnerty's deposition transcript dated June 24, 2021 is attached hereto as Exhibit A-2 (the "Finnerty Dep.>").

² Finnerty does not opine that (1) any Defendant made a material misrepresentation or omission, (2) anyone manipulated the market, or (3) any omissions caused the damages that he purports to measure. *See* Finnerty Dep. 62:22-63:3, 133:6-18 ("I am not rendering opinions on liability, market manipulation, anything to do with liability. That is not within the scope of my mandate; it is not in my report."), 140:12-142:5, 142:24-143:5, 148:24-149:13, 152:25-153:23, 166:9-21, 170:7-16.

created solely for the purposes of this case that has never before been used to measure damages in a Section 10(b) case and has no known error rate. Because Finnerty's opinions are irrelevant and unreliable, the Court should exclude Finnerty's opinions and testimony.

BACKGROUND

Plaintiffs' experts' damages opinions are based on a new, unpleaded theory of liability. Plaintiffs now claim that Defendants violated Section 10(b) by failing to disclose that a "non-HFT's" resting orders might become "stale" and be "picked-off" by an HFT before the non-HFT was able to cancel that resting order and resubmit it at a different price. Pls.' Mem. in Supp. of Mot. for Class Cert. ("Mem"), ECF No. 617, at 3, 21-22; Lauer Rep. 17-18. Plaintiffs abandon any pretense of proving manipulation; indeed, Plaintiffs' Memorandum and expert reports do not point to evidence of a single manipulated trade. Instead, Plaintiffs' experts advance what is essentially a strict liability damages model which would impose liability and damages under Section 10(b) whenever their calculations indicate that there is an "average excess markup" between (1) transactions that occur when a non-HFT's resting order is filled by an order submitted by an HFT, and (2) transactions where a non-HFT's resting order is filled by a non-HFT, on a given date for a given security on a given Defendant-exchange. But this damages model has nothing to do with conduct prohibited by Section 10(b) and is not tied to the allegations in the Second Consolidated Amended Complaint (ECF No. 252, "SCAC").

Plaintiffs filed two expert reports. Plaintiffs' first proposed expert report (by David Lauer, ECF No. 619-1) purports to use a sample trade markup analysis to show that non-HFTs had worse order execution quality on their resting orders when trading with HFTs compared to when non-HFTs traded with other non-HFTs using resting orders. Lauer Rep. 1. A trade markup analysis measures the difference in price between an actual trade and a hypothetical price. Hendershott

Rep. ¶¶ 228, 293, 296; Finnerty Dep. 237:7-14, 242:7-243:4. Trade markouts are often used to measure average order execution quality. *Id.*

Finnerty adopts the Lauer trade markout proposal and then attempts to use a regression analysis to estimate the excess costs HFTs supposedly imposed on non-HFTs' resting orders, controlling for market and industry factors, and treating the remaining average excess markout as the damages for putative class members. Hendershott Rep. ¶ 231. Notably, Finnerty did not actually apply his proposed methodology to measure damages for a single trade. Finnerty Dep. 219:10-221:16. Finnerty's methodology (1) requires that putative class members first provide detailed information about their trades (including the venue where those trades executed), (2) requires that the putative class members' trades all be somehow linked through an unspecified and untested "matching" method to the exchanges' order data so that it can be determined whether those trades were resting orders that traded with an HFT counterparty (as chosen by Lauer), and (3) will then calculate the damages to putative class members based on the number of shares traded times the average excess markout on a given day for a given security on a given Defendant-exchange. *See generally* Finnerty Rep.; Finnerty Dep. 191:6-192:16, 194:21-196:12; Hendershott Rep. ¶¶ 298-309.

Finnerty proposes a secondary or alternative methodology to be used when a putative class member does not know where a trade executed. Finnerty Rep. ¶ 46. He calls this alternative an "exchange-volume-weighted average excess trade markout" methodology. *Id.*

In short, Finnerty takes Lauer's trade markout proposal, which measures—at most—average execution quality, and attempts to transform it into a methodology to measure damages for individual putative class members. Hendershott Rep. ¶ 296. Yet Finnerty does not provide sufficient detail or actually apply his framework to any trades to illustrate that either of his two

proposed methodologies actually work, let alone that either of his two methodologies can be applied on a classwide basis. *See* Hendershott Rep. ¶¶ 222-38, 296-339.

Defendants are submitting two expert reports. First, Professor Terrence Hendershott's report contains his rebuttal of Finnerty's damages methodology. *See* Hendershott Rep. ¶¶ 222-38, 296-343. Second, Professor Arnold Barnett's report explains the fundamental statistical flaws permeating the methodologies offered by Lauer and Finnerty.³

LEGAL STANDARD

A rigorous *Daubert* and Rule 702 analysis must be undertaken at the class certification stage to determine whether proposed expert opinions are admissible, and proposed expert testimony that does not satisfy *Daubert* and Rule 702 must be excluded. *See In re Namenda Indirect Purchaser Antitrust Litig.*, No. 115CV6549CMRWL, 2021 WL 100489, at *7 (S.D.N.Y. Jan. 12, 2021) (“[A] complete *Daubert* inquiry is necessary to analyzing a motion to exclude at the class-certification stage, and . . . only expert reports that would otherwise be admissible at trial under *Daubert* can be considered in support of class certification.”); *In re Aluminum Warehousing Antitrust Litig.*, 336 F.R.D. 5, 29 (S.D.N.Y. 2020) (“Courts in the Second Circuit regularly subject expert testimony to *Daubert*'s rigorous standards insofar as that testimony is relevant to the Rule 23 class certification analysis.”); *In re LIBOR-Based Fin. Instruments Antitrust Litig.*, 299 F. Supp. 3d 430, 470-71 (S.D.N.Y. 2018) (“expert evidence submitted at the class certification stage is subject to the *Daubert* standard”); *IBEW Local 90 Pension Fund v. Deutsche Bank AG*, No. 11 CIV. 4209 KBF, 2013 WL 5815472, at *1-2 (S.D.N.Y. Oct. 29, 2013).

³ The Hendershott Report and the Barnett Report are attached as Exhibits 1 and 2, respectively, to Defendants' concurrently filed Memorandum of Law in Opposition to Lead Plaintiffs' Motion for Class Certification.

The Second Circuit has “distilled Rule 702’s requirements into three broad criteria: (1) qualifications, (2) reliability, and (3) relevance and assistance to the trier of fact.” *In re Namenda*, No. 1:15-cv-6549, 2021 WL 2403727, at *7; *see also Nimely v. City of New York*, 414 F.3d 381, 396–97 (2d Cir. 2005). Plaintiffs bear the burden of establishing that the opinions offered by their experts are admissible under the above criteria. *See LIBOR*, 299 F. Supp. 3d at 466 (citing *United States v. Williams*, 506 F.3d 151, 160 (2d Cir. 2007)).

ARGUMENT

Finnerty’s opinions, proposed report, and testimony should be excluded for three independent reasons: (1) his opinions rest on Lauer’s fatally flawed opinion that an excess markup calculation is a proper measure of damages; (2) his opinions are irrelevant because they are not tied to the theory of liability pleaded by Plaintiffs; and (3) his damages methodologies are unreliable.

I. Finnerty’s Opinions Should Be Excluded For The Same Reasons As Lauer’s.

The foundations of Finnerty’s opinions are the opinions expressed by Lauer. For example, Finnerty relies on Lauer’s description of the Defendants’ products and services, Lauer’s list of supposed HFT firms, Lauer’s descriptions of how HFT firms supposedly trade, Lauer’s description of latency arbitrage, Lauer’s markup analysis, and Lauer’s opinion that “adverse selection” by HFT firms resulted in actual damages to non-HFT investors. *See, e.g.*, Finnerty Rep. (citing nearly exclusively to Lauer’s Report); Finnerty. Dep. 19:25-20:4, 25:18-26:2, 64:22-65:4, 66:8-68:14, 69:6-12, 70:13-17, 92:19-93:11, 111:18-22, 120:12-19, 155:3-17, 159:17-161:2, 164:10-18, 235:6-236:20, 262:6-17; Hendershott Rep. ¶ 231; Barnett Rep. ¶ 29. Because Finnerty’s opinions are afflicted with the same deficiencies as Lauer’s, Finnerty’s opinions should be excluded for the reasons set forth in Defendants’ concurrently filed Memorandum of Law in Support of Defendants’ Motion to Exclude the Opinions and Testimony of David Lauer.

II. Finnerty's Opinions Should Be Excluded Because They Are Not Relevant.

A proposed expert's testimony must be capable of assisting "the trier of fact to understand the evidence or to determine a fact in issue." Fed. R. Evid. 702(a). This "is essentially a requirement of relevance," which mandates that the expert testimony have a valid scientific connection to the pertinent inquiry. *Amorgianos v. Nat'l R.R. Passenger Corp.*, 137 F. Supp. 2d 147, 163 (E.D.N.Y. 2001), *aff'd*, 303 F.3d 256 (2d Cir. 2002). "Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful." *Raskin v. Wyatt Co.*, 125 F.3d 55, 66 n.5 (2d Cir. 1997). Here, the Finnerty Report is irrelevant for two reasons: (1) Finnerty's damages methodology is not aligned with Plaintiffs' theory of liability, and therefore does not satisfy the *Comcast* standard; and (2) Finnerty's report lacks sufficient detail, and therefore does not assist the Court in determining whether damages can be determined on a classwide basis.

A. Finnerty's Methodology Does Not Fit Plaintiffs' Theory of Liability.

An expert's damages model must "fit" the plaintiffs' theory of liability. "[A] model purporting to serve as evidence of damages in [a] class action must measure only those damages attributable to that theory [of liability]. If the model does not even attempt to do that, it cannot possibly establish that damages are susceptible of measurement across the entire class for purposes of Rule 23(b)(3)." *Comcast*, 569 U.S. at 35; *see also Roach v. T.L. Cannon Corp.*, 778 F.3d 401, 407 (2d Cir. 2015) ("*Comcast* held that a model for determining classwide damages relied upon to certify a class under Rule 23(b)(3) must actually measure damages that result from the class's asserted theory of injury," as opposed to something else.); *Malletier v. Dooney & Bourke, Inc.*, 525 F. Supp. 2d 558, 572-73 (S.D.N.Y. 2007) (excluding expert's opinion because of a "lack of fit between" expert's methodology and the theory of liability).

Finnerty's damages model fails to align with Plaintiffs' theory of liability in several ways. First, it does not align with the allegations in the SCAC. Although Plaintiffs seek to certify a class solely based on unspecified omissions about the risk of adverse selection caused by a claimed inability to cancel and reprice "stale resting orders" before an HFT "picked them off," that claim is not pleaded in the SCAC.

Second, if Plaintiffs had attempted to plead a "stale order" omission claim, an admissible damages model would attempt to measure *only* the purported damages caused by Defendants' unspecified omissions. Finnerty, however, does not even attempt to measure the damages tied to Defendants' unspecified omissions. Instead, he is attempting to measure, if anything, the difference in average execution quality for resting orders between (1) "non-HFTs" trading with "HFTs" and (2) "non-HFTs" trading with other "non-HFTs." Finnerty attributes that entire calculated "excess markout" amount (attempting to control only for market and industry factors) to the Defendants, without purporting to calculate what portion of it, if any, is tied to any omission by any Defendant. *See* Hendershott Rep. ¶¶ 245-65.

Third, Finnerty's methodology makes no effort to disentangle all of the factors that could result in a negative markout. Indeed, a negative markout in a particular circumstance could be caused by factors that have nothing to do with the Defendants, such as an HFT's own proprietary trading algorithms, investments in employees and technology, and use of data sources not provided by the Defendants; a non-HFT's particular trading strategies; an executing broker-dealer's execution strategy; the national securities market structure mandated by the SEC; or other lawful causes that might contribute to the existence of a negative markout. *See* Hendershott Rep. ¶¶ 259, 325. Finnerty ignores those factors and just assumes that the entirety of every excess average markout is solely attributable to Defendants' unspecified omissions. Finnerty makes no effort to

examine what the world would have looked like but for the unspecified omissions, and makes no effort to account for his admission that at least part of the decline in trade execution costs in the U.S. equity markets is attributable to so-called high frequency trading. Finnerty Dep. 136:13-24. In sum, Finnerty's model would impose damages on the Defendants simply because a trade happened between an HFT and a non-HFT on a Defendant's exchange that happened to have an average excess markout, without examining whether that markout had anything to do with any conduct prohibited by Section 10(b).

Fourth, Finnerty's damages model does not fit Plaintiffs' theory of liability because Finnerty would award damages to investors who were not actually injured even by Plaintiffs' *new* theory of liability. Because Finnerty relies upon an *average* excess markout, individual putative class members would be awarded damages for trades even if those investors did not actually experience a negative markout with respect to particular trades. *See* Hendershott Rep. ¶¶ 319-33. A model that would award damages to putative class members who were not injured under the Plaintiffs' own theory of liability fundamentally cannot "fit" a plaintiffs' theory of liability. *Cf. TransUnion LLC v. Ramirez*, 141 S. Ct. 2190, 2208 (2021) ("Every class member must have Article III standing in order to recover individual damages," which requires a concrete injury in fact, rather than a hypothetical injury.)

Fifth, rather than measuring actual damages attributable to Plaintiffs' Section 10(b) claim, Finnerty instead attempts to measure average execution quality based on comparing an actual trade with a *hypothetical* price not connected to any putative class member or trade. Finnerty Dep. 237:7-14, 238:9-18, 242:7-243:4. Put differently, even if Finnerty's methodology could accurately measure something, it would not be harm purportedly caused by Defendants' alleged conduct.

“The first step in a damages study is the translation of the *legal theory of the harmful event* into an analysis of the economic impact *of that event*.” *Comcast*, 569 U.S. at 38 (internal quotation marks and citation omitted). Finnerty “ignored that first step entirely.” *Id.*

B. Finnerty Presents An Incomplete Model Lacking Crucial Details.

Finnerty’s opinions also cannot aid the Court in evaluating whether damages can actually be determined on a classwide basis, because he presents an incomplete model and never attempts to apply his model to a single actual trade. At the class certification stage, an expert is required to provide “sufficient detail about the proposed methodology to permit a court to determine whether the methodology is suitable to the task at hand.” *Weiner v. Snapple Beverage Corp.*, No. 07 CIV. 8742 DLC, 2010 WL 3119452, at *9 (S.D.N.Y. Aug. 5, 2010) (internal quotations omitted); *Royal Park Invs. SA/NV v. Wells Fargo Bank, N.A.*, No. 14CV09764KPFSN, 2018 WL 739580, at *6 (S.D.N.Y. Jan. 10, 2018) (at class certification stage, damages expert “must show that the methods he plans to use are applicable to a class”). Finnerty’s proposed methodology is unworkable because, among other reasons, it assumes that putative class members will be able to supply specific data without considering whether they will actually be able to do so. The record evidence is that his assumption is wrong.

1. Finnerty’s Primary Methodology Is Not Sufficiently Explained.

The Finnerty Report adopts Lauer’s theory that damages can be measured by markouts and then attempts to offer a methodology for calculating damages on a classwide basis. Hendershott Rep. ¶ 231. Finnerty assumes that the excess markouts computed by Lauer are a measure of “adverse selection,” and seeks to estimate the incremental effect of an investor’s resting order

being filled by an HFT firm rather than a non-HFT firm.⁴ *Id.* He proposes a regression model that tries to control for the effects of contemporaneous movements in market and industry indices. *Id.*

Finnerty proposes to run his regression model for each possible exchange, security, and date combination (“triplet”). Finnerty Rep. ¶¶ 45, 47. Each regression would generate a coefficient that estimates the average incremental effect of a non-HFT resting order trading against an HFT, for each particular triplet. Hendershott Rep. ¶ 233. Finnerty’s primary model then proposes to use these coefficients to calculate damages in instances where (1) a putative class member traded on a Defendant’s exchange using a non-HFT firm as its broker, (2) the class member’s order was a resting order, and (3) the counterparty who traded with that order is classified by Lauer as being an HFT firm. *Id.* In these cases, damages would be estimated by finding the coefficient corresponding to the particular triplet and multiplying it by the number of shares the class member bought or sold of that stock, on that day, on that exchange. *Id.*

To obtain the data necessary to perform his damages calculation, Finnerty proposes a process driven by the putative class members. Finnerty Dep. 191:6-192:16, 194:21-196:12. He envisions a scenario where each putative class member “will provide” a list of their trades during the proposed class period including: (1) the date and timestamp of the trade, (2) the stock symbol, (3) the stock transaction price, (4) the number of shares traded, and (5) the Defendant exchange venue where the trade was executed. Finnerty Rep. ¶ 43; Finnerty Dep. 194:21-195:22. Finnerty’s methodology requires determining, on a trade-by-trade basis, whether a trade was executed on one of the Defendants’ exchanges because the proposed class definition includes only “investors who

⁴ As Professor Hendershott explains, there is nothing manipulative or improper about “latency arbitrage.” Hendershott ¶ 325. Indeed, in 2020, the SEC staff recognized that the “majority of [the studies examining how algorithmic trading and high frequency trading affect price efficiency] find that algorithmic trading and high frequency trading improve price efficiency and decrease the time that it takes for prices to incorporate new information.” *Id.*

purchased and/or sold equity securities . . . on a registered public stock exchange generated by defendants” and excludes trades executed on other venues. Mem. 2; Hendershott Rep. ¶ 236.

Finnerty, however, made no attempt to determine whether putative class members actually have any of this information or can obtain it. For example, Finnerty testified that he did not know, and had not even asked, whether Plaintiffs had venue information for their own trades. Finnerty Dep. 206:18-207:2; 307:14-308:22. If he had asked, Finnerty would have learned that, even after seven years of litigation, Plaintiffs have been able to locate execution venue information for at most 1.5% of their own trades. Hendershott Rep. ¶ 151. Moreover, the evidence suggests that class members will face even bigger, if not insurmountable, hurdles in obtaining information about where their trades were actually executed. *Id.* ¶¶ 298-300; Finnerty Dep. 219:9-22 (venue information is not “provided routinely on the trade confirm[ations]”).

Furthermore, even for trades where venue information is available, Finnerty’s methodology requires determining (1) whether the class member’s trade was a resting order before execution, (2) the market participant identifier (MPID) of the class member’s executing broker to ensure that it is *not* on Lauer’s list of HFT firms, and (3) the MPID of the counterparty broker to ensure that it *is* on Lauer’s list of HFT firms. Hendershott Rep. ¶¶ 233, 236, 301; Finnerty Dep. 291:13-294:5, 297:7-13. The only way to determine whether a trade meets these criteria is to match the information the investor provides with the exchanges’ order level data. *Id.* ¶¶ 304-09, 314-24. But the Finnerty Report is completely silent on how this matching process will occur, and he did not attempt to do any actual matching. Hendershott Rep. ¶¶ 304-09; Finnerty Dep. 198:3-25; 202:3-204:20, 219:19–221:16.

When asked how the matching process would work, Finnerty alluded to unspecified “matching algorithms” he claimed would solve the matching issues by linking individual trades

without execution venue information to the exchanges' order level data sets, but Finnerty did not identify such an algorithm in his report, what the data sources would be, or how it would function. Hendershott Rep. ¶¶ 304-09. During his deposition, he testified that he was not actually sure whether executing venue information was contained in any particular database. Finnerty Dep. 209:20-211:25. If an algorithm exists that could perform the matching exercise, Finnerty presumably would have identified it. *See TransUnion*, 141 S. Ct. at 2212 ("The production of weak evidence when strong is available can lead only to the conclusion that the strong would have been adverse."). In other testimony, Finnerty said that he would defer to "class counsel and the claims administrator" on how to handle issues that would arise if specific trade and venue information could not be provided. Finnerty Dep. 202:3-203:12.

Finnerty also ignores another issue that will present a serious obstacle to many putative class members—disentangling "group trades." A group trade occurs when an investment manager submits a global order entered for multiple investors to a broker, which is then split into multiple child orders, each of which has multiple executions at different venues. Hendershott Rep. ¶¶ 334-39. Hendershott provides an illustration of the problem from one of Plaintiffs' trade data:

There are over 3,500 transactions totaling 800,000 shares that purport to be purchases for MRK shares on 3/4/11 handled by Credit Suisse for Lead Plaintiff VIGERS. VIGERS's custodian data reports that VIGERS purchased only 13,100 shares on that day. Of these over 3,500 executions, Credit Suisse claims that their data "does not specify which rows in the Credit Suisse Data Export might pertain to trades placed on behalf of Lead Plaintiffs."

Id. ¶ 335. In other words, when global orders are submitted on behalf of many investors and those investors are later allocated a portion of the resulting trades, there is no way to determine which executions (or which *fractions* of which executions) in the resulting "group trade" pertain to each investor. Finnerty did not consider the issues presented by group trades, and he offers no classwide method for how to handle this routine occurrence. *Id.* ¶¶ 334-39; Finnerty Dep. 253:23-258:9.

Finnerty's primary methodology is insufficiently explained. He is silent on how putative class members would acquire the necessary data, or how the necessary matching across separate data sets would be completed, and he fails to show the availability of sufficient data or matching for even a single trade, let alone on a classwide basis.

2. Finnerty's Secondary Methodology Is Not Sufficiently Explained And Is Fundamentally Flawed.

In a single paragraph of his Report, Finnerty sketched out a secondary methodology to be used if the venue information required for his primary methodology is unavailable and putative class members' orders cannot be matched to trades in the exchanges' data sets. Finnerty Rep. ¶ 46. Specifically, Finnerty proposes to calculate an "exchange-volume-weighted average excess trade markout" for all of the exchanges where a particular security traded using weights reflecting exchanges' trading volume on each day for each security. *Id.*; Hendershott Rep. ¶ 237. Finnerty claims that the "trade-volume weights reflect the relative likelihoods of the stock trade occurring on each exchange on which shares of the stock actually traded that day." Finnerty Rep. ¶ 46. The resulting weighted-average excess markout would then be applied to the number of shares traded by an investor to calculate its damages. *Id.*

Initially, Finnerty leaves unexplained how his secondary methodology would work given that a trade's execution venue must be known before it is possible to determine whether a trade involved a non-HFT resting order that was filled by an HFT. Hendershott Rep. ¶ 311. Any trade where the execution venue is unknown cannot be matched to an execution on one of Defendants' exchanges. *Id.* ¶¶ 310-13; Finnerty Dep. 145:3-17, 291:13-294:5, 297:7-13. Therefore, all trades for which Finnerty's secondary methodology is designed are, by definition, ineligible for damages because it could not be determined that they were resting orders that traded with an HFT. Hendershott Rep. ¶ 312. Finnerty admitted as much when he testified that

if we can't document that it was a resting order taken out by an HFT, then I don't think that it would be subject to damages. We can't put it in the damages calculation unless we are sure that it was a resting order that was taken out by an HFT. If that can't be documented, can't be demonstrated, then that order isn't entitled to damages.

Finnerty Dep. 293:21-294:5.

Furthermore, using "trade volume weights," presumably only for the Defendants' exchanges, ignores the fact that a sizable percentage of equity security trades during the proposed class period were not executed on any securities exchange. Hendershott Rep. ¶ 26. Finnerty's secondary methodology does not account for this and is therefore insufficiently explained. Moreover, as is the case with his primary methodology, Finnerty does not apply his secondary methodology to a single actual trade. Finnerty Dep. 219:19-220:2. And this problem is likely to be most significant for investors who are least likely to have traded on exchanges and have venue information—retail investors. Hendershott Rep. ¶¶ 55,123-161. Finnerty's proposal would award them damages despite the fact that some retail brokers send no trades to exchanges.

3. Finnerty Fails to Provide Sufficient Detail About His Damages Methodology.

Finnerty's opinion needed to provide "sufficient detail about [his] proposed methodology to permit a court to determine whether the methodology is suitable to the task at hand." *Weiner*, 2010 WL 3119452, at *9. But for the reasons set forth above and detailed in Paragraphs 296-324 and 334-39 of the Hendershott Report, Finnerty fails this requirement. Finnerty does not demonstrate how either of his damages methodologies could possibly work in practice, because he did not attempt to actually apply either methodology to any actual trade. Finnerty Dep. 219:19-220:2. When questioned about how his models would actually work and whether they are based on unrealistic expectations about data being provided by putative class members, Finnerty

attempted to punt those issues to the claims administrator.⁵ Finnerty also testified that considering such fundamental data issues was simply not “part of [his] damages methodology,” (Finnerty Dep. 215:5-6), and that the claims administrator would have to determine how to proceed if venue information was not available (*id.* 216:20-23). Because Finnerty provides insufficient detail about how his methodologies would work—and does nothing to verify that they *can* work—his opinions do not provide a basis for concluding that damages may be determined on a classwide basis.

III. Finnerty’s Opinions Should Be Excluded Because They Are Not Reliable.

Rule 702 also requires that an expert’s testimony be reliable and that “(b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case.” Fed. R. Evid. 702(b)-(d). The expert’s analysis must be reliable “at every step.” *Amorgianos*, 303 F.3d at 267. When an opinion is “based on data, a methodology, or studies that are simply inadequate to support the conclusions reached, *Daubert* and Rule 702 mandate the exclusion of that unreliable opinion testimony.” *Id.* at 266.

A. Finnerty’s Regression Analysis Is Fundamentally Flawed And Cannot Form The Basis Of A Reliable Damages Methodology.

As Professor Barnett demonstrates, the analyses underpinning Finnerty’s damages model suffer from serious statistical flaws which render the model nearly useless and incapable of providing a basis for calculating classwide damages. Barnett Rep. ¶¶ 9, 11-12. Far from

⁵ At one point, Finnerty testified that perhaps the claims administrator could *assume* that a trade without venue information executed on one of Defendants’ exchanges. Finnerty Dep. 298:21-23. “Punting” determinations of liability and damages—requisite elements of Plaintiffs’ claims—to a claims administrator would violate Defendants’ Seventh Amendment and due process rights. *See, e.g., In re Asacol Antitrust Litig.*, 907 F.3d 42, 53 (1st Cir. 2018) (claims administrator cannot determine an element of plaintiffs’ claims).

demonstrating that his model is a viable methodology for estimating damages for putative class members, Finnerty's regressions demonstrate the opposite. *Id.* ¶¶ 11, 45.

1. Finnerty's Regression Analysis Fails To Account For Other "Major Factors" Affecting Markouts.

Plaintiffs bear the burden of showing that Finnerty's regression analysis has accounted for all the "major factors" that may affect the markouts. *Reed Const. Data Inc. v. McGraw-Hill Companies, Inc.*, 49 F. Supp. 3d 385, 403 (S.D.N.Y. 2014), *aff'd*, 638 F. App'x 43 (2d Cir. 2016). But Finnerty controls only for market and sector "returns," which he approximates using ETFs tracking market and sector indices. Finnerty Rep. ¶¶ 28, 33, 49; Finnerty Dep. 259:25-260:12. Finnerty does not even attempt to account for all the other significant factors, discussed above, which contribute to markouts. *Supra*, at 7-8. Moreover, Finnerty offers no reason why he believes that these other factors are so insignificant that they do not need to be controlled for. Where, as here, there is "some indication that the excluded variables would have impacted the results," the expert's opinion is unreliable. *In re Live Concert Antitrust Litig.*, 863 F. Supp. 2d 966, 974 (C.D. Cal. 2012).

2. Finnerty's Regression Analysis Explains Almost None Of The Variation In Markouts Across HFT/Non-HFT Trade Combinations.

Finnerty's regression analysis explains almost none of the variation in markouts between non-HFTs' resting orders trading with HFTs versus trading with other non-HFTs—which means that the variation in the markouts calculated by Finnerty cannot be attributed to the one thing Plaintiffs seek to attribute it to, the activities of so-called HFTs. Barnett Rep. ¶ 29. In general terms, a regression analysis strives for a mathematical formula that best fits a given data set and summarizes the main patterns within the data. *Id.* ¶ 30. A widely used statistic called R^2 (also

referred to as the coefficient of determination) indicates the usefulness of a particular regression formula. *Id.* ¶¶ 33-35.

The purpose of the R^2 calculation is to determine whether a model is better than nothing when evaluating the effect of variables on each other. *Id.* ¶¶ 34-35. The calculation starts with attention to the “straw” model that says “nothing matters.” With respect to Finnerty’s regression analysis, the straw model posits that, regardless of the involvement of an HFT in a particular trade and regardless of market or industry movements, the markout is the same. *Id.* ¶ 34. In the straw model, the markout in every situation is estimated by the average of markouts over the full data set. *Id.* Then, to reflect the extent to which the proposed model falls short as a summary of the actual data, the scatter of actual markouts around the average is noted and summarized with a discrepancy score. *Id.*

The next step in the R^2 calculation is to turn to the regression formula and use it to predict what happens under particular conditions—such as a trade between an HFT and a resting non-HFT order when the market return increases a certain amount. *Id.* ¶ 35. The R^2 calculation then compares the predicted markout in those conditions with the actual markout and, over all the transactions, calculates a discrepancy score like the score that was calculated for the straw model. *Id.* Once the two discrepancy scores have been calculated, the R^2 records the *percentage reduction* in the discrepancy score when the straw model is replaced by the regression model. *Id.* Given that the straw model is that “nothing matters,” one would expect a sizable reduction in the discrepancy score—*i.e.*, a large R^2 —if the regression model successfully explains why markouts vary in different situations. *Id.*

For Finnerty's overall regression model, the R^2 is 0.006.⁶ Finnerty Rep. Ex. 2. That means moving from the "nothing matters" model to Finnerty's model reduces the discrepancy score only by a minuscule *six-tenths of one percent*. Barnett Rep. ¶ 36. The low R^2 value means that Finnerty's regression model explains almost nothing about the cause of any markouts, and certainly does not establish that activities by HFTs are the cause of variations in markouts. *Id.*; see Finnerty Dep. 272:17-273:11 (agreeing that R^2 measures the level of explanatory power of a model and admitting his model has a low R^2).

Despite the fact that the low R^2 means that Finnerty's model does not fit the actual data, Finnerty claims that his regression formulas yield highly specific estimates about the alleged harms caused by HFTs in particular circumstances. Barnett Rep. ¶¶ 38-39. For example, for his pilot study related to trades on May 15, 2012 on Arca, the coefficient for non-HFT to HFT transactions—which represents the penalty per share that HFTs supposedly impose on non-HFTs—is estimated in Finnerty Exhibit 3 as -0.00187, with a margin of error of 0.000005. *Id.* ¶ 38. That margin of error in the penalty estimate is only about 1/400th of the estimate itself, implying enormous precision. *Id.* In sum, Finnerty claims that a regression model that had virtually no explanatory power somehow still managed to determine almost exactly how HFTs affect trading outcomes. *Id.* Such a model is not reliable because it cannot generate reliable assessments about the negative economic impact (if any) of the purported HFTs trading with the resting orders entered by purported non-HFTs. *Id.* ¶ 41.

⁶ Finnerty also ran his regression model on smaller data sets, but the R^2 values do not differ meaningfully in those smaller sets: the majority of his regressions' R^2 values are below .01. Finnerty Rep. Exs. 3-4.

3. The Coefficients In Finnerty's Regression Formulas Demonstrate That His Model Is A Failure.

When confronted with his low R^2 values, Finnerty claimed that those values merely reflected a “lot of inherent randomness in the data,” and that what really matters is the coefficients that he calculated. Finnerty Dep. 273:13-274:10. In a regression analysis, the coefficients are numbers that quantify the average relationship between the dependent variable—here the markout—and the explanatory variables that supposedly determine the dependent variable. Barnett Rep. ¶ 42. More specifically, a coefficient estimates how rapidly the dependent variable changes when an explanatory variable changes. *Id.* In Finnerty's model, the coefficient of the Non-HFT to HFT variable estimates the average markout for the non-HFT party when it trades with an HFT, relative to the situation where a non-HFT trades with another non-HFT. *Id.* The variations in the coefficients calculated by Finnerty, however, provide yet another reason to conclude that his model does not produce reliable results. *Id.* ¶¶ 42-45.

For example, the coefficient for the “market return” variable is always statistically significant and is sometimes positive and sometimes negative, which means that in Finnerty's model a rising market sometimes increases markouts and sometimes decreases them. *Id.* ¶ 43.a. Likewise, the “industry return” coefficients vary widely from positive to negative, meaning that a rising industry return also sometimes increases markouts and sometimes reduces them. *Id.* ¶ 43.b. Similar variations exist even for the market return variable for the same security trading on the same exchange on consecutive days. *Id.* ¶ 43.c. Finnerty does not acknowledge or explain how those coefficient swings are consistent with a reliable model.

In fact, Finnerty's coefficients for particular Non-HFT to HFT combinations vary across his regressions in ways that *contradict* his asserted regression results. *Id.* ¶ 43. For example, when considering trading on Arca on May 15, 2012, the coefficient for Non-HFT to HFT transactions is

estimated by Finnerty as -0.00187, with a margin of error of 0.000005. For the next day, however, the same coefficient was estimated at -0.00258. *Id.* The difference between negative 0.00187 and negative 0.00258 (*i.e.*, 0.00071) is much larger than the margins of error that Finnerty calculates for both estimates. *Id.* Indeed, Barnett observed that, under Finnerty's model, the chance is less than one in one billion that random fluctuations could cause such a discrepancy in the May 15 and May 16 coefficients, and Finnerty offers no explanation why HFTs supposedly play such substantially different roles on two successive days. *Id.* Finnerty does not explain how his model can be accurate yet display results that under his own methodology have less than a one in one billion chance of occurring. The unexplained fluctuations in Finnerty's coefficients are another fact that casts significant doubt on the reliability of his model. *See LIBOR*, 299 F. Supp. 3d at 468 (“inconsistent results are an ‘indicia of unreliability’ in an expert’s methodologies”).

Finnerty's regression models exhibit almost no explanatory power as to why markouts vary across various HFT/non-HFT trade combinations. The coefficients calculated by Finnerty cast further doubt on the reliability of his models. These serious problems demonstrate that Finnerty has not offered a statistically reliable model to calculate the economic harm that he claims HFTs inflict on non-HFTs. *See LIBOR*, 299 F. Supp. 3d at 559 (“[A]cceptance of regressions as a statistical method generally does not imply that all regressions will be admissible under *Daubert*. Questions remain in each case as to whether the regression takes reliable data as inputs . . . whether the regression is properly specified . . . and whether the expert properly interprets the regression to support any conclusions ultimately reached”); *Reed Const. Data Inc.*, 49 F. Supp. 3d at 400; *IBEW Loc. 90 Pension Fund*, 2013 WL 5815472, at *10.

B. Finnerty's Secondary Methodology Is Not Reliable.

Finnerty's secondary "exchange-volume-weighted" average methodology, which he proposes to use when a putative class member cannot provide specific information about the execution of its trades (including the venue), also is unreliable.

First, it is nonsensical to use an exchange volume weighted average to measure damages when the venue cannot be determined. Hendershott Rep. ¶¶ 310-13. If the venue is not known, then there is no basis to assume, let alone conclude, that the trade executed on any of the Defendants' exchanges (as opposed to another exchange or a non-exchange venue). For that reason alone, such a trade should fall outside Plaintiffs' class definition, which requires that an investor's trade take place "on a registered public stock exchange generated by defendants." Pls.' Mem. 2. And without venue information, there is also no basis to conclude that it was a resting order that traded against an HFT. Hendershott Rep. ¶¶ 314-24.

Second, Finnerty's secondary methodology is unreliable from a statistical perspective because it necessarily assumes that putative class members' brokers send all of their orders to one of the Defendants' exchanges. Not only is that assumption unfounded (Hendershott Rep. ¶ 26), but the small amount of brokers' data that Plaintiffs were able to assemble demonstrates that there is no basis to assume that all brokers trade only on Defendants' exchanges or that any broker's propensity to execute trades on any of the Defendants' exchanges remained constant during the purported class period. Barnett Rep. ¶ 48. Finnerty, however, pays no attention to any of this and he would award damages to an investor whose broker rarely, if ever, sent orders to any of Defendants' exchanges. *Id.* ¶¶ 54-57.

Third, the secondary methodology would skew the assignment of damages in ways that are based entirely on speculation. To illustrate that point, Barnett provides an example where Nasdaq

is assumed to have 18% of the trading volume for a particular stock on a particular day; in that situation, Finnerty would assume that there was an 18% chance that an order had been executed on Nasdaq. Barnett Rep. ¶ 58. Finnerty would then presumably assign a weight of 18% to his regression coefficient for that stock on that day for Nasdaq and assign other coefficients for the other Defendants' exchanges. *Id.* Finnerty also reports that his pilot study found that Nasdaq had both the highest average excess trade markout and the highest cumulative trading volume. *Id.* ¶ 59. As a result, Finnerty's secondary methodology would be "tilted" toward assigning trades to Nasdaq, where the alleged damages are the highest, in cases where the venue *is actually unknown*. *Id.* A methodology that relies on nothing more than speculation that trades actually executed on Nasdaq (or any of the other Defendants' exchanges) is not reliable. *See, e.g., Reed Const. Data Inc.*, 49 F. Supp. 3d at 400.

C. Finnerty Relies Upon A Series Of False Factual Assumptions.

An expert report that is based on faulty assumptions must be excluded. *E.g., Bank of Am., N.A. v. Bear Stearns Asset Mgmt.*, 969 F. Supp. 2d 339, 358 (S.D.N.Y. 2013) (expert report premised on unfounded assumptions excluded); *Johnson Elec. N. Am., Inc. v. Mabuchi Motor Am. Corp.*, 103 F. Supp. 2d 268, 284 (S.D.N.Y. 2000) (expert opinion reliant on faulty assumptions excluded); *see also Amorgianos*, 303 F.3d at 266 ("Thus, when an expert opinion is based on data, a methodology, or studies that are simply inadequate to support the conclusions reached, *Daubert* and Rule 702 mandate the exclusion of that unreliable opinion testimony."). Finnerty's damages model relies on many demonstrably incorrect factual assumptions. In particular:

- **Assumption:** Putative class members will have, or will be able to obtain, the data Finnerty requires for his primary damages methodology.

Reality: Plaintiffs have been able to locate data (in particular venue information), for at most 1.5% of their alleged trades. Hendershott Rep. ¶ 300. There is grave doubt about whether other putative class members will be able to obtain the requisite data at all. *See id.* ¶¶ 298-300.

- **Assumption:** The detailed trading records actually obtained by putative class members can be reliably matched to exchange data, in order to determine eligibility for damages.

Reality: Finnerty provides no details as to how this supposed matching process would work and did not attempt to match a single trade to any exchange order level data. *See id.* ¶¶ 301-24; Finnerty Dep. 197:3-8 (“[W]hen I wrote the report I assumed the exchange could be identified, or if not the exchange at least the fact it occurred on an exchange could be identified from the broker-dealer. If that is not true, then we have to consider possibly just throwing out the claim.”).

- **Assumption:** An average measure of damages for individual trades is appropriate because there are no pertinent differences between putative class members.

Reality: Investors are different—they have different goals, risk tolerances, investment approaches, investment strategies, and levels of sophistication. *See* Hendershott Rep. ¶¶ 276, 326-33. For example, some “non-HFTs” would have wanted their resting orders to be filled quickly, even if there was a probability that they might have been able to achieve a slightly better price by canceling and resubmitting the order at a different price. *Id.* ¶¶ 263-65. As another example, some brokers’ algorithms are designed in ways that *will not* cancel or reprice orders in the way Lauer and Finnerty assume. *Id.* ¶ 265.

- **Assumption:** There is no need to address how group orders placed by an investment manager on behalf of multiple investors will be allocated.

Reality: This is a difficult, if not insurmountable, problem to solve for Plaintiffs’ trades, let alone to resolve on a classwide basis. Finnerty says nothing about the issue. *Id.* ¶¶ 334-39.

- **Assumption:** Excess trade markouts are an appropriate measure of actual economic harm suffered by all putative class members.

Reality: Markouts do not represent *actual* harm because they do not measure whether an investor *actually* lost money on any trade—only whether the investor’s position showed a hypothetical loss on paper during the arbitrarily chosen first second after the trade based on the arbitrarily chosen hypothetical price. *See, e.g., id.* ¶¶ 228, 276, 285-92.

The incorrect assumptions embedded in Finnerty’s damages methodologies are additional reasons that his opinions are not reliable.

D. Finnerty’s Novel Damages Model Was Created Solely For The Purpose of Litigation And Is Unreliable For Additional Reasons.

Finnerty’s methodology was constructed solely for the purposes of this litigation, and there is no evidence that the type of model he created has ever been accepted as a way to calculate economic harm or actual damages. *See* Finnerty Dep. 47:24-48:10, 237:7-24 (testifying that he is not aware of any case where a trade markout was used as a basis for determining or allocating damages), 270:25-271:14. Hendershott confirms that Finnerty applies the markout metric in a way that “is not consistent with how academics, regulators, and practitioners used realized spreads [similar to a markout measure], nor is it defensible as a scientific approach.” Hendershott Rep. ¶ 340. The fact that this novel theory has not been used before to measure damages and was created for purposes of this litigation is yet another indication Finnerty’s damages opinions are not reliable. *See Washburn v. Merck & Co.*, 213 F.3d 627 (2d Cir. 2000) (affirming exclusion of expert opinion in part because the expert’s opinion “did not emanate from his own research in the field, but rather was developed for the purposes of litigation”).

In addition, the Supreme Court has identified several factors bearing on reliability, including “ ‘(1) whether a theory or technique can be (and has been) tested, (2) whether the theory or technique has been subjected to peer review and publication . . . , (3) a technique’s known or potential rate of error, and the existence and maintenance of standards controlling the technique’s

operation, and (4) whether a particular technique or theory has gained general acceptance in the relevant scientific community.’ ” *Amorgianos*, 303 F.3d at 266 (quoting *Daubert*, 509 U.S. at 593-94). Finnerty’s opinions satisfy none of these factors.

First, Finnerty’s methodology has not been tested and he did not, for example, test the sensitivity of the excess markout calculation to different MPID classifications; nor did he test different measures of price or time for the hypothetical second price that forms the basis for the markout analysis. Hendershott Rep. ¶¶ 279, 342. Further, Finnerty describes additional work that should have been done to test his model but was not. Finnerty Dep. 20:5-20. Second, a markout damages model has never been subjected to peer review or publication because it has never been used before. Finnerty Dep. 47:24-48:10, 237:7-24. Third, Finnerty’s models do not have a known or potential rate of error. Hendershott Rep. ¶¶ 341-42. Fourth, Finnerty’s markout damages model has not gained general acceptance in the relevant scientific community as a measure of damages; instead, it is used in the relevant academic community only as a measure of execution quality. *Id.* ¶ 340. These factors also show that Finnerty’s methods and opinions are not reliable.

CONCLUSION

Defendants respectfully request that the Court grant Defendants’ motion and enter an order excluding the opinions and testimony of John Finnerty.

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